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x	y	z	a		x	y	z	a	
64	48	1599	1601	B	312	25	48984	48985	A
160	36	1677	1685	B					
60	11	1860	1861	A	308	75	50244	50245	A
					300	125	52812	52813	A
144	108	2021	2029	B					
16	63	2112	2113	$\}$ A	364	27	66612	66613	A
56	33	2112	2113		360	81	68080	68081	A
96	28	2499	2501	B					
					420	29	88620	88621	A

Also solved in less detail by E. E. WHITFORD, C. E. FLANAGAN, and G. I. HOPKINS.

GEOMETRY.

Note. The following remark should be made in connection with the solution of Geometry 417 in the September issue:

Three planes determine *either* a point (which may be at infinity if the intersections of the planes in pairs are parallel) *or* a straight line in which the planes are concurrent (which may be at infinity if the planes are parallel). Some of the 220 points required may therefore prove to be replaced by such lines of concurrency of three planes. Whenever the word *line* is used in this solution it refers to a straight line in which three planes are concurrent.

CALCULUS.

337. Proposed by R. P. BAKER, University of Iowa.

Show that for a, b relatively prime integers,

$$\int_0^1 |\cos 2\pi ax + \cos 2\pi bx| dx = \frac{2}{\pi ab} \left\{ \frac{a+b}{\sin \frac{\pi}{a+b}} - \frac{a-b}{\sin \frac{\pi}{a-b}} \right\}$$

or

$$= \frac{1}{\pi ab} \left\{ (a+b) \cot \frac{\pi}{2(a+b)} - (a-b) \cot \frac{\pi}{2(a-b)} \right\}$$

according as a and b are both odd or one of them is even.

SOLUTION BY THE PROPOSER.

Take the first case with $a > b$.

The zeros of the integrand in the path of integration are

$$\xi_{1r} = \frac{2r-1}{2(a+b)}, \quad r = 1, 3, 5, \dots (a+b)$$

and

$$\xi_{2s} = \frac{2s-1}{2(a-b)}, \quad s = 1, 3, 5, \dots (a-b).$$

If these are $\xi_1, \xi_2, \xi_3, \dots \xi_{2a}$ in order of magnitude the integral is

$$\frac{1}{\pi ab} \left[b \sin 2\pi a \xi + a \sin 2\pi b \xi \right] \begin{matrix} \xi_1, \xi_3, \dots \xi_{2a-1} \\ \xi_2, \xi_4, \dots \xi_{2a} \end{matrix}.$$

Consider first the sines of $2\pi b \xi_{1r}$. The r th is preceded by $r-1$ of its own set and by s of the other set where